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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT INVESTIGATIONS

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FOREST INSECT CONDITIONS ON THE IDYLLWILD RECREATIONAL AREA. SAN BERNARDINO NATIONAL FOREST - SEASON OF 1937.

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by
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Berkeley, California
January 22, 1938.

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Forest Insect Laboratory
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FOREST INSECT CONDITIONS ON THE IDYLLWILD RECREATIONAL AREA, SAN BERNARDINO NATIONAL FOREST - SEASON OF 1937.

FOREWORD

A survey of forest insect conditions on the Idyllwild Recreational area and adjoining regions in the San Jacinto district of the San Bernardino National Forest was made by the Bureau of Entomology and Plant Quarantine in November, 1937. It is the purpose of this report to show conditions found during this survey; to review previous surveys and control work up to 1937; and to recommend such measures as seem necessary to protect the forest from further losses caused by insects.

The area involved includes the forest covered mountain territory centering around the main recreational region in Strawberry Valley, and extending to Logan Creek, Tarquitz Peak, Thomas Mountain and Kenworthy; altogether about 20,000 acres.

Public interest in the protection of this area against bark-beetle depredations has been active since 1923. About 2000 acres are intensively used for recreation and summer homes, with an additional 3000 acres available for similar development. The San Jacinto State Park primative area adds an attractive back country. Altogether about 50,000 people use this region annually. Its recreational value depends largely upon the attractions of its natural forest cover.

REVIEW OF PREVIOUS EXAMINATIONS, SURVEYS AND CONTROL WORK TO 1936:

Several insect examinations and surveys have been made of the area during the past decade. It has not been kept under continuous observation, but sufficient data have been secured to show the trends of the infestations and the results of control work carried out during the period.

An examination was made by F. P. Keen in 1927, who estimated an infestation amounting to about 200 attacked trees on an area of 12,000 acres. This is the earliest estimate available on the amount of insect caused losses and is used as an initial value in reviewing the subsequent infestation trends. Keen made another examination of the same area in December 1928 and estimated an infestation of 100 trees for that year.

Upon request made by the State Forester and the Idyllwild Chamber of Commerce, J. M. Miller in June 1928 made an examination of Strawberry Valley and estimated an infestation of 60 trees on the 2000 acre area. He also recommended that this area be proclaimed a state control district, which was done later that same year. Following establishment of the control district , control work was carried out by the State Division of Forestry and by several interested private parties. Unfortunately no examinations were made during 1929, so the immediate results of this control work are not known.

During May 1930, Miller and Salman examined Strawberry Valley and reported an infestation of 42 infested trees. Later, in November, Salman made a survey of the same area and reported an infestation of 50 trees. In April 1931 Salman made a second examination and submitted a report recommending a plan for maintenance control which was partially carried out by the several private parties concerned. From June 1931 to September 1933 nothing is known of infestation conditions since there were no examinations made and no control work done during this period.

During October and November 1933, a complete coverage by survey and control work of the entire timbered area of 20,000 acres was undertaken by CCC crews under the supervision of A. C. Browne. The first survey in the fall of 1933 showed that the infestation was becoming much worse than at any previous time. Control work was continued the following spring and resulted in treating a total of 2107 infested trees. This work was discontinued in April 1934 due to the reduction of the CCC program in southern California, and no further survey of control work was done until June 1936 when Patterson made a survey and estimated a total infestation of 100 trees on the area of 20,000 acres.

Since the parts of the area examined in these various surveys were not of uniform size, it is necessary to reduce the loss to terms of trees per section in order to secure a comparison of the annual losses for the period. The infestation trends on this basis for the decade would appear thus:

1927 - Loss per section	10 trees
1928 - Loss per section	5 trees
1929 - No survey	----
1930 - Loss per section	17 trees
1931 - No survey	----
1932 - No survey	----
1933 - Loss per section	60 trees
1934 - No survey	----
1935 - No survey	----
1936 - Loss per section	12 trees

Although survey records are broken and incomplete, it is obvious that there was a decided build up toward epidemic conditions in 1933 and that this was decidedly reduced following the control work of the fall and winter of 1933-34.

CONTROL WORK OF 1936-37:

Upon request made by the Idyllwild Chamber of Commerce and the State Forester, J. M. Miller examined the area in November 1936 and reported an active infestation which he recommended be reduced by maintenance control carried out before losses could increase. In response to these recommendations, an effort to thoroughly clean the main recreational region and outlying contributing areas of infestations by direct control methods was undertaken during the winter of 1936-37.

This project was a joint undertaking between the Federal Forest Service and the State Division of Forestry, acting in behalf of the private land owners. It was agreed that both services would contribute toward a joint survey to mark the infested trees on both Federal and private lands, that the Forest Service would treat all trees on Government lands with CCC labor and that the state would direct the treatment of trees on private holdings. In practical results this arrangement resolved into a 50-50 proposition. J. W. Bongberg was employed by the San Bernardino National Forest and Charles Van Fleet was assigned by the State Forestry Service from the San Jacinto district. These two men spotted the infested trees and supervised the control work. Control work on Government lands was carried out with crews from the Kenworthy CCC Camp. The treating of infested trees on the other lands was mainly effected by their disposal to woodcutters and also by private parties where infested trees occurred on their own property.

The total project area covered about 13,000 acres and included in addition to the main Idyllwild area, Strawberry Valley, Thomas Mountain, Tarquitz Valley, Round Valley, Hemit Lake, and the Kenworthy Plateau. A total of 83 trees containing a volume of 32,470 BM were treated on Government land. The cost to the Government for its share of the project amounted to a total of $578.00, or $6.96 per treated tree.

RESULTS OF 1936-37 CONTROL WORK:

Since no report has been submitted by the State Division of Forestry, information on the number of trees treated or otherwise disposed of on its share of the project area is not available. Lack of these data prevent a full evaluation of the results of this control project. However, it was possible to determine the immediate results on the areas worked, which included the principal recreational sites. The 1937 infestation on these areas was decidedly reduced to a low point. The recurrent infestations on other areas not thoroughly cleaned were not greatly reduced from the previous status. The greatest reduction in losses occurred in the better site stands that were thoroughly cleaned and the least reduction resulted where control work was not completely carried out, and in the marginal type stands. In general a marked decrease in apparent throughout the entire area with the greatest reduction resulting on the developed grounds and the least in the more remote areas. It is obvious that this project was successful in demonstrating the effectiveness of maintenance control in protecting these stands from epidemic losses.

THE 1937 SURVEY:

Period of examination:- The 1937 survey was made during the period November 6 to 10, 1937 by J. E. Patterson and assistant, of the Bureau of Entomology and Plant Quarantine. The established method used in making surveys of infested areas was employed. The entire area was examined in order to work out an estimate of the total losses, and a

sufficient number of trees sampled to secure an analysis of the infestation and to determine the species of beetle responsible for it. A permanent study plot was also established, marked and surveyed.

Reorganization of the area:- Since previous surveys were of an extensive character and not sufficiently detailed to provide complete data on the composition and trends of the yearly infestations, the 1937 survey was arganized to overcome these limitations. The area covered was reorganized and divided into four separate units corresponding to type and topographic conditions. These units are designated: (1) Idyllwild; containing the principal developed areas and timbered mainly with ponderosa pine; (2) Keen Camp; an area of mixed Jeffrey pine and Coulter pine; (3) Thomas Mountain; which includes only the timbered north slope forested with Jeffrey pine, ponderosa pine and sugar pine; (4) Kenworthy plateau; containing a pure stand of Jeffrey pine. The infestation area as now organized is shown on the map on page 5. It contains approximately 20,000 acres which, however, is not completely timbered. Many openings and brush areas occur which reduce the timbered acreage to about 15,000 acres, or 23 sections.

The one sample plot established is located in Section 36, T 5 S, R 3 E, San Bernardino Mer. Its location is shown on the accompanying map. The plot is a rectangular strip 10 chains wide and 120 chains long, paralleling the main road between Keen Camp and Hemit Reservoir, and contains 60 acres. Plot reference marker is an aluminum band tacked to Jeffrey pine tree at roadside on section line 1 chain south of SE corner of Section 31, marking the southeast end of the plot. The timber stand is composed of Jeffrey pine, Coulter pine, and ponderosa pine, of the marginal type.. The 1937 insect loss marked on this plot amounted to a total of 15 infested trees; 13 Jeffrey pine trees attacked by the California flatheaded borer, and 2 Coulter pine trees attacked by the Western pine beetle.

Estimated volume of timber losses:- The number of trees killed by insects on the entire area during the seasons of 1937 is estimated to be 230 trees. This number of infested trees represents an average loss of 10 trees per section. However, the loss was not evenly spread over the whole area, but was largely concentrated in Unit 2, which showed an average loss of 17 trees per section. The year's loss by units is estimated as follows:

Unit	No. of sections	Acres	Loss per section	Total loss
1 - Idyllwild	9	5760	5 trees	45 trees
2 - Keen Camp	8	5120	17 "	135 "
3 - Thomas Mt.	3	1920	5 "	15 "
4 - Kenworthy	3	1920	12 "	35 "
TOTALS	23	14,720	10 trees	230 trees

Tree species and insects involved in 1937 losses:- The present infestation is largely confined to Jeffrey pine and Coulter pine with only a small percentage scattered through the ponderosa pine stands. The sugar pine is now largely free of infestation, although heavy losses of this tree have occurred in the past around Strawberry and Tarquitz Valleys. The highest concentration of infested trees occurred in the Jeffrey pine stands in the Keen Camp and Kenworthy units, and was greatest in trees growing on drier, exposed sites. The survey records show that the 1937 losses occurred in the following ratio by tree species:

Jeffrey pine	65%
Coulter pine	20%
Ponderosa pine	12%
Sugar pine	3%

The composition of this year's infestation consisted largely of attacks by the California flatheaded borer, Melanophila californica. This beetle attacks Jeffrey pine, ponderosa pine and Coulter pine, the three principal pine species of the area. Examination of 60 infested trees showed that all the Jeffrey pine, 80% of the Coulter pine and 60% of the ponderosa pine were attacked by this beetle. The Western pine beetle, Dendroctonus brevicomis, and the mountain pine beetle, Dendroctonus monticolae, were also represented, but their attacks formed a very low percent of the total infestation.

Present infestation trends:- Present infestation trends indicate decreased losses with approach toward normal conditions. A review of losses during the past 5 years show that in 1935 the infestation reached the lowest point during the period with a loss estimated at 170 trees. An increase occurred in the 1936 infestation with a loss of 303 trees. The 1937 loss of 230 trees shows a return toward the low point in the cycle reached in 1935, which is believed to be near the minimum for these stands and may be considered the normal insect loss. The 1937 infestation showed no aggressive tendencies and had reverted largely to the marginal stands and to the poorer sites indicating recessive characteristics. However, heavy increases in infestations on this area have suddenly occurred in the past, making unsafe any predictions of the future state of conditions.

NECESSITY FOR CONTINUED SURVEYS, AND FUTURE PLANS.

Since past infestations on this area have greatly fluctuated within short periods, with frequent occurrence of epidemic losses, it is important that the area be kept under close observation. In order to closely follow infestation trends and seasonal developments, and to have immediately available current information on insect depredations necessary for timely control recommendations, it is essential to inaugurate a system of continued surveys of the area. Present plans provide for at least one annual survey with more frequent examinations if necessary. These surveys should provide the following data: the amount of seasonal and annual losses; the location of infestation

centers relative to timber type and recreational activities; species of insects causing the damage, species of trees attacked, and the results of control work done.

One sample plot has already been established in the Jeffrey pine - Coulter pine type. At least one additional plot is needed in the ponderosa pine - sugar pine areas.

RECOMMENDATIONS.

Since the present infestation is normal and without aggressive tendencies, control work covering the entire area is not recommended. Due to greatly increased cost of treating scattered infested trees in the remote sections , further reduction from the low status of the present infestation is not justified or recommended.

However, maintenance control on developed lots and on intensively used areas is highly recommended. All infested trees which develop on these sites should be treated as soon as they appear, regardless of the season. Wood fuel is needed and this demand may be largely supplied by infested trees. Their utilization for this purpose is recommended as a control measure. Trees so utilized should be peeled and the bark burned immediately after the trees are cut.

Continued surveys of the area are necessary to follow the trend of the infestations and at least one survey each year is recommended. An additional sample plot should be established to study conditions in the ponderosa - sugar pine types.

REPORTS AND MEMORANDA

1930 - Memorandum concerning the San Jacinto Project, San Bernardino National Forest. November 14 by K.A.Salman

1931 - Program for Maintenance Control of Injurious Insects in the Idyllwild District, San Bernardino National Forest - April by K.A.Salman

1933 - Summary of CCC Insect Control Work Accomplished During the Summer and Fall of 1933 on the San Bernardino National Forest - Dec. 4 - by Ashley C. Browne.

1934 - Forest Insect Control Work Conducted in South California National Forests by CCC During Season of 1933 Jan. 9 - by Ashley C. Browne.

1936 - Report of Forest Insect Conditions in the Southern National Forests of the California Districts - June - by J.E.Patterson.

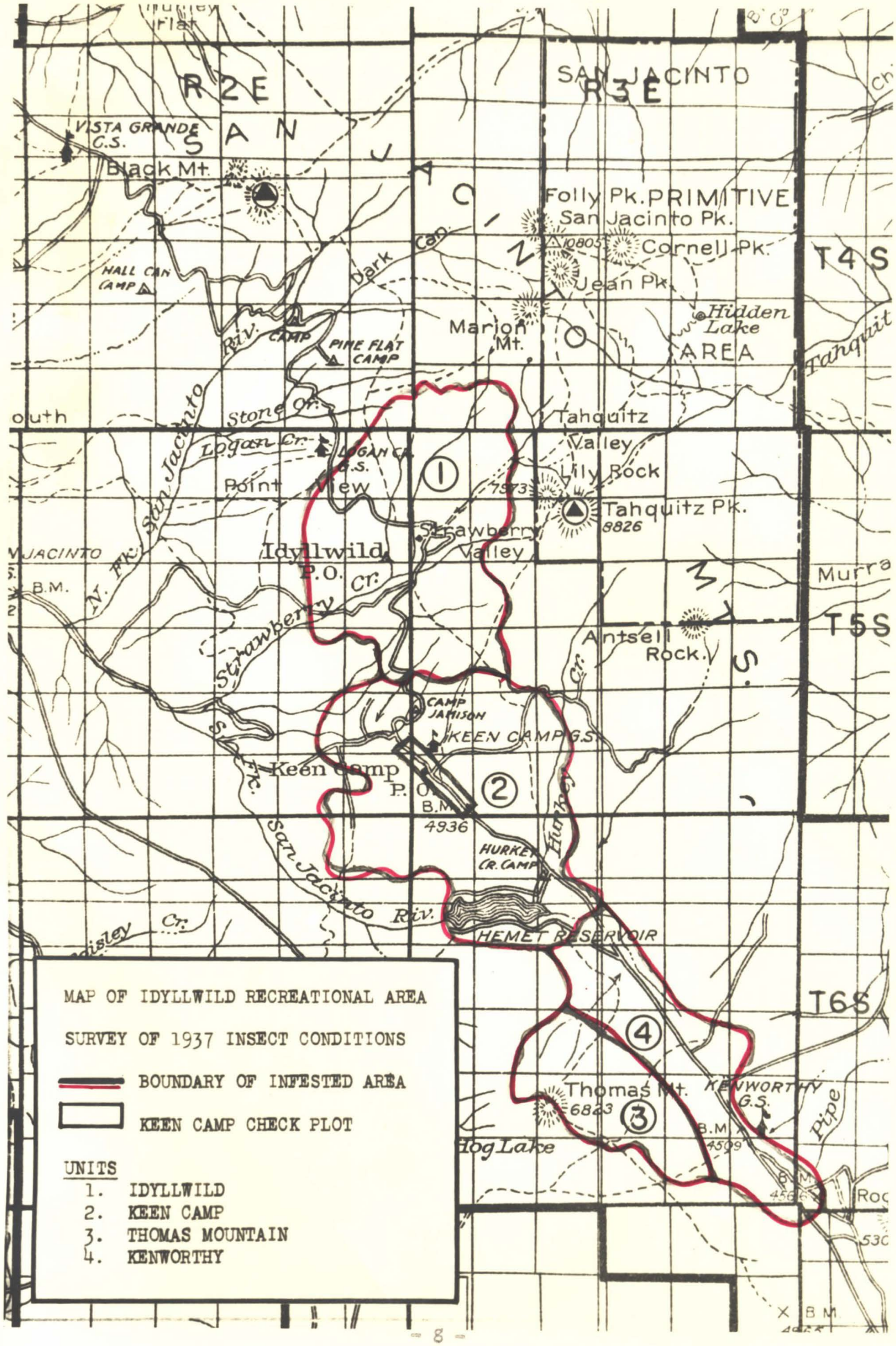
1936 - Memorandum for Forest Supervisor - Barkbeetle Survey, Idyllwild Area - Nov. 27 - by J.M.Miller.

1936 - Memorandum for Supervisor and Files - Re: Insect Control, Idyllwild Area - Nov. 28 - by Wm.S.Brown

1937 - Memorandum for Dr. F. C. Craighead - Re: Areas in Southern California Requiring Insect Surveys - Jan. 25 - by J.M.Miller.

1937 - San Jacinto Control Project, San Bernardino National Forest - Season 1936-37 - April 9 - by J.W.Bongberg.

1937 - Forest Insect Conditions in Several California Forests Nov. 23 - by J.E.Patterson.



MAP OF IDYLLWILD RECREATIONAL AREA

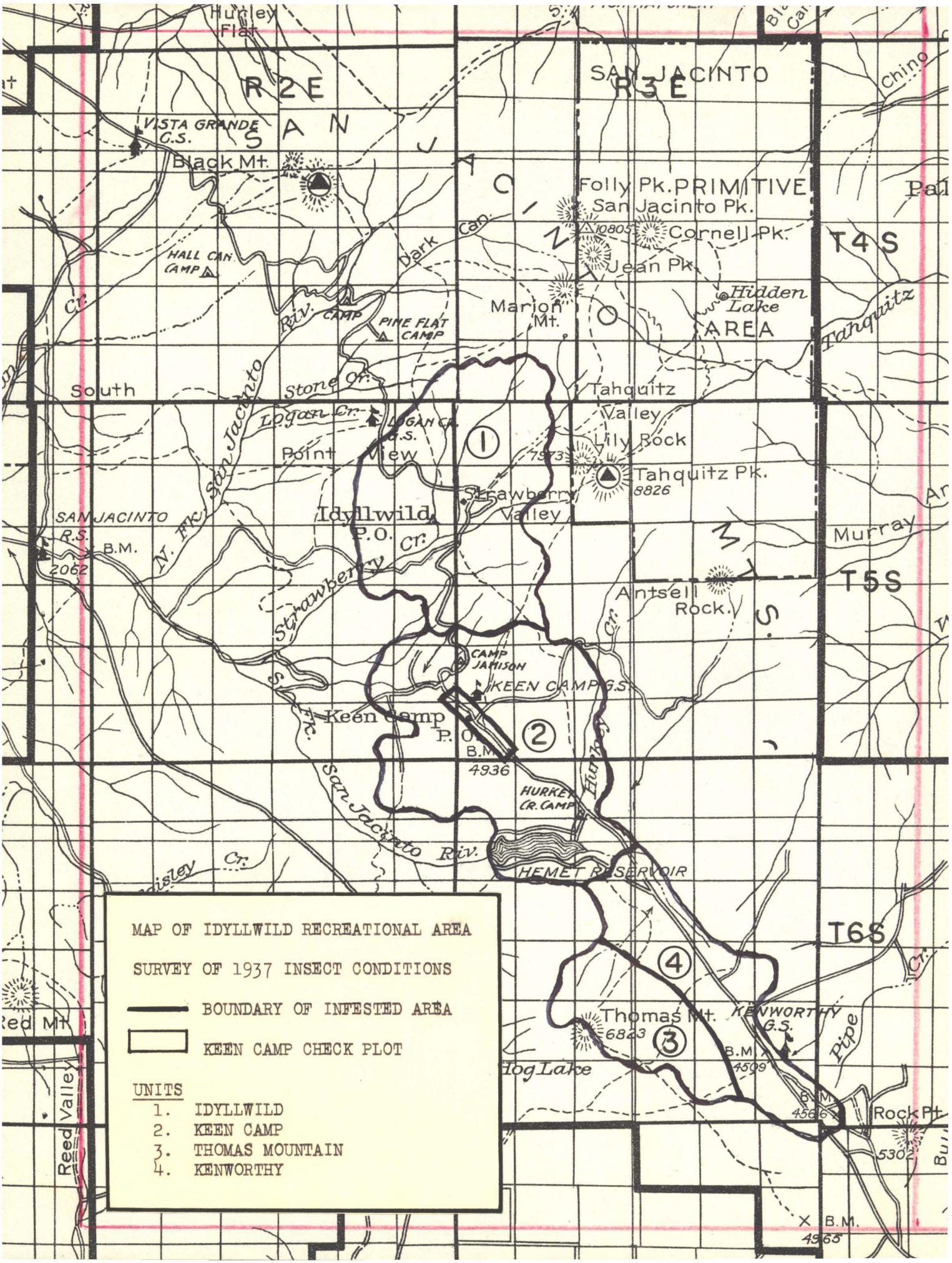
SURVEY OF 1937 INSECT CONDITIONS

BOUNDARY OF INFESTED AREA

KEEN CAMP CHECK PLOT

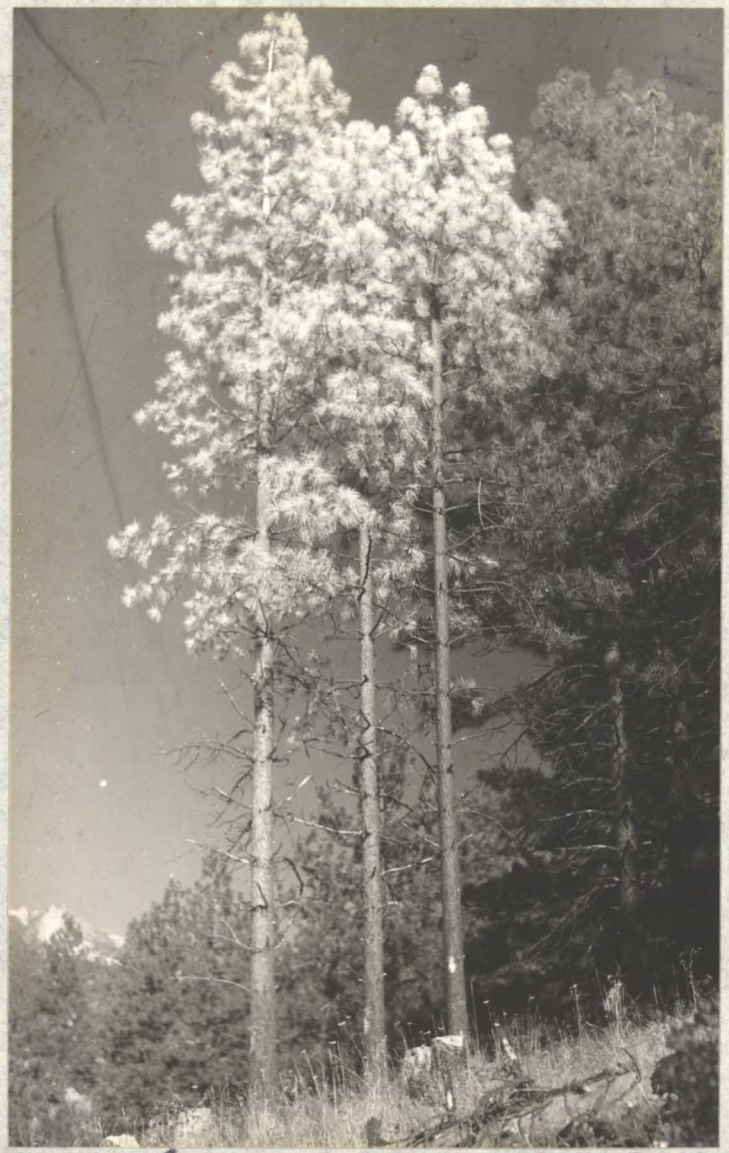
UNITS

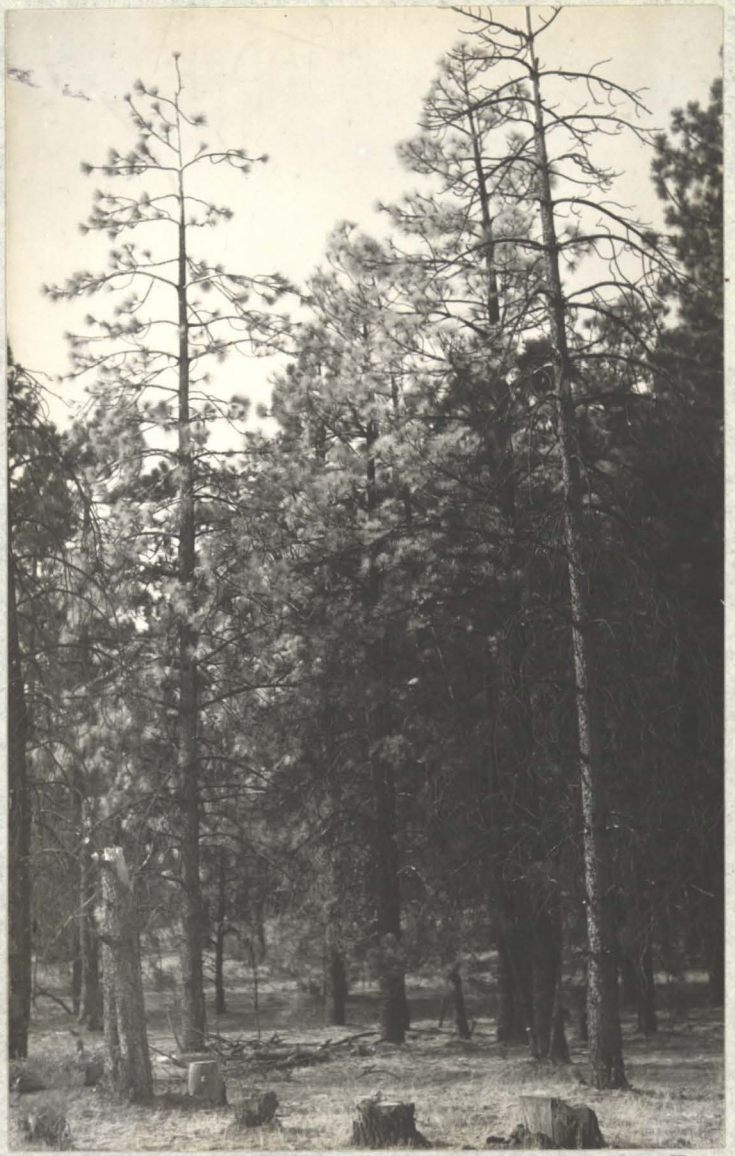
1. IDYLLWILD
2. KEEN CAMP
3. THOMAS MOUNTAIN
4. KENWORTHY


Hurley Flat
R2E
SAN JACINTO
R3E
VISTA GRANDE C.S.
Black Mt.
Folly Pk. PRIMITIVE
San Jacinto Pk.
10805
Cornell Pk.
Jean Pk.
T4S
HALL CAN CAMP
Dark Can.
Cr.
Riv.
CAMP
PINE FLAT CAMP
Marion Mt.
Hidden Lake AREA
Tahquitz
South
Stone Cr.
Logan Cr.
LOGAN CA.
G.S.
Point View
Valley
Lily Rock
Tahquitz Pk.
8826
Strawberry
Idyllwild
P.O.
SAN JACINTO R.S.
B.M.
2062
N. Fk. San Jacinto
Strawberry Cr.
Murray
T5S
Antsell Rock
CAMP JAMISON
KEEN CAMP G.S.
Keen Camp
P. O.
B.M.
4936
S. Fk.
San Jacinto Riv.
HURKEY CR. CAMP
HEMET RESERVOIR
T6S
Thomas Mt.
6823
KENWORTHY G.S.
B.M.
4599
Hog Lake
Pipe
Red Mt.
Reed Valley
B.M.
4566
Rock Pt.
5302
B.M.
4965
MAP OF IDYLLWILD RECREATIONAL AREA
SURVEY OF 1937 INSECT CONDITIONS
BOUNDARY OF INFESTED AREA
KEEN CAMP CHECK PLOT
UNITS
1. IDYLLWILD
2. KEEN CAMP
3. THOMAS MOUNTAIN
4. KENWORTHY

No. 10001. A large Jeffrey pine infested by the California Flatheaded borer, cut and treated by control crews in March 1937. This tree was one of several mature trees infested in Strawberry Valley, one of the highly developed sections of the recreational area.

No. 10002. Same tree shown in the above photograph. Showing method of treating infested trees to kill the beetle brood. The tree is felled, limbed, and the bark peeled from the bole and placed alongside the prostrate log. After it is prepared in this way, the mass is burned. March 1937.





No. 10056. Group infestation of the California Flatheaded borer in Jeffrey pine stand in the Keen Camp Unit, November 1937. A. Shows the early fading color phase of recently attacked trees. The sorrel color which is rendered lighter than the normal green in the photograph is a distinguishing character used in spotting infested trees. B. A group of infested trees in the red color phase indicating an earlier attack, and one tree infested the previous year which has lost all the needles indicating that the beetle brood has developed and left the tree.